

XXII. *Note on the colours of British Caterpillars.* By
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THE interesting problems presented by the colouring of Lepidopterous larvæ have been the subject of valuable communications from several distinguished naturalists, especially Darwin, Wallace, Jenner Weir, A. G. Butler, M'Lachlan, Meldola and Weismann.* Their observations indicate that, as a general rule, caterpillars which are dull-coloured and have a smooth skin, or are nocturnal in their habits, are greedily eaten by birds. On the other hand, spiny and hairy caterpillars are spared, and are often brightly coloured. Certain species, such as *Deilephila Euphorbiæ*, *Abraxas Grossulariata* and *Zygæna Filipendulæ* are distasteful to birds, and in these cases brilliant colouring serves as a warning, and, consequently, as a protection. Lastly, there are a few species, such as *Cherocampa Elpenor* and *C. Porcellus*, which appear to frighten birds by their resemblance to small reptiles, a resemblance singularly heightened by the curious eye-like spots on the thorax.

I am not aware, however, that anyone has taken a *general* view of Lepidopterous larvæ from a statistical standpoint. It might be urged, even while admitting the foregoing explanations, that they were exceptional cases. I have, therefore, thought that it might be worth while to examine the larvæ as a whole to see what cases there might be, if any, which would not fit in with the preceding theoretical views. In the following tables I have given all the butterflies and the larger species of moths.

Let us first consider the butterflies. We have in this country 66 species,† out of which 18 are spiny, and two may fairly be called hairy. I do not speak of mere pubescence, but of true hairs and spines. Now, out of these 20 species 10 are black, two greyish, six brown or

* I have myself published some remarks on the same subject in last year's "Fortnightly Review."

† For working out these numbers, and especially for the preparation of the tables, I am greatly indebted to Mr. Meldola.

brownish, one greyish-green and only one (*L. Sybilla*) green. Thus, while green is so preponderating a colour among smooth-skinned or ordinarily pubescent caterpillars (37 out of the 66 species of butterflies being of this colour), only a single spiny species is thus coloured.

Now, let us look at these numbers under a different aspect. Out of 66 species 10 are black; and, as we have already seen, all these are spiny or hairy. The larva of *Parnassius Apollo*—a species reputed to have been taken in this country—is stated to be black, and is not hairy or spiny; but, as it has red spots and blue tubercles, and the neck is furnished with a yellow forked appendage, it is probably sufficiently protected. The larva of *Papilio Machaon* is also marked with black and is provided with strongly-scented tentacles, which probably serve as a protection.

There are some other colours, which are instructive from the present point of view. Take brown, for example. There are 16 species of this colour, and of these, seven are hairy or spiny.

Red and blue are rare colours among caterpillars. Omitting minute dots, we have six species which are more or less marked with red or orange, viz., *A. Aglaia*, *V. Antiopa*, *N. Lucina*, *C. Alsus*, *P. Cratægi* and *P. Machaon*. Of these, two are spiny, two hairy, and one protected by scent-emitting tentacles. The orange medio-dorsal line of *C. Alsus* is not very conspicuous, and has been omitted in some descriptions. The larvæ of *Papilio Podalirius* and *Parnassius Apollo*—two species formerly reputed British—are also marked with red, and these are likewise provided with tentacles. Blue is even rarer than red; in fact, none of our butterfly larvæ can be said to exhibit this colour. The caterpillar of *P. Apollo* is figured as having blue tubercles.

Now, let us turn to the moths. Of these caterpillars I have tabulated the *Sphingidæ*, *Cocliopidæ*, *Procridæ*, *Zygænidæ*, *Nolidæ*, *Lithosidæ*, *Euchelidæ*, *Chelonidæ*, *Liparidæ*, *Bombycidæ*, *Drepanulæ* and *Pseudo-Bombyces*—these groups comprising nearly all our larger species. The *Hepialidæ*, *Zeuzeridæ* and *Sesidæ* have been omitted, because these larvæ are all internal or subterranean feeders, and are devoid of any striking colour.* This leaves

* See some remarks on this subject in a paper by Mr. Meldola, "On a certain Class of Cases of Variable Protective Colouring in Insects," in "Proc. Zool. Soc." for 1873, p. 159.

122 species, out of which 68 are hairy or downy; and of these, 48 are marked with black or grey, 15 brown or brownish, two yellowish-green, one bluish-grey, one striped with yellow and black and one reddish-grey. Of the two yellowish-green hairy species, which might be regarded as exceptions, *Z. Lonicæræ* is marked with black and yellow, and *N. albulalis* is variable in colour, some specimens of the caterpillar being orange. This last species is also marked with black, so that neither of these species can be considered of the green colour, which serves as a protection. Thus, among the moths tabulated, there is not a single hairy species of the usual green colour. On the other hand, there are 50 species with black or blackish caterpillars, and of these, 48 are hairy or downy.

In eleven of our larger moths the caterpillars are more or less marked with red. Of these three are hairy, one is an internal feeder, four have reddish lines, which probably serve for protection by simulating lines of shadow,* and one (*D. Euphorbiæ*) is inedible. Of the remaining two, *Calocampa exoleta* (not included in the tables) has a red line on the side of the body. The last, *D. livornica*, is rare, and I have never seen the caterpillar, but, to judge from figures, the reddish line and spots would render it not more but less conspicuous amongst the low herbage which it frequents.

Seven species only of our larger moths have any blue; of these four are hairy, the other three are hawk-moths. In one (*A. Atropos*) the violet colour of the side stripes certainly renders the insect less conspicuous among the flowers of the potato, on which it feeds. In *C. Nerii* there are two blue patches, which, both in colour and form, curiously resemble the petals of the periwinkle, on which it feeds. In the third species, *C. Porcellus*, the bluish spots form the centres of the above-mentioned ocelli.

Among the *Geometridæ* the caterpillars are very often brown, and closely resemble bits of stick, the similarity being much increased by the peculiar attitudes they assume. The large brown caterpillars of certain *Sphingidæ* are night feeders, concealing themselves on the ground by day, and it is remarkable that white species, such as *S. Convolvuli*, which feed on low plants, turn brown as they increase in age and size; others, like the *Smerinthi*,

* The oblique stripes on the sides of the sphinx larvæ may serve a similar purpose.

which frequent trees, and cannot therefore descend to the ground for concealment, remain green throughout life. Omitting these, we find in the table 23 brown species, of which 12 are hairy, and two have extensile caudal filaments. Three at least of the others, though not *Geometridæ*, closely resemble bits of stick, and place themselves in peculiar stiff attitudes. The others are small species.

It has been suggested to me by Mr. Meldola that in certain instances hairs may serve as a protection, instead of acting simply as signals of distastefulness. This appears to be the case with such species as *Pacilocampa Populi*, which has a fringe of long hairs along the sides, just above the legs. In these cases the insects rest by day on lichen or bark, to which they assimilate in colour and marking, and in such situations would stand a chance of detection, in spite of their protective colouring, if they stood out in bold relief, and cast a sharp shadow. The hairs may thus have been acquired for the purpose of shading off the sharp outline of the caterpillars, an analogous function being probably fulfilled by the row of fleshy protuberances along the sides of *Lasiocampa quercifolia*, and species of *Catocala*.

Thus, summing up the caterpillars, both of the butterflies and moths, out of the 88 spiny and hairy species tabulated, only one is green (*L. Sybilla*), and even this may not be protectively coloured, since it has yellow warts and white lateral lines. On the other hand, a very great majority of the black and brown caterpillars, as well as those more or less marked with blue and red, are either hairy or spiny, or have some special protection. The general review, then, which I have here very imperfectly attempted, confirms, in a remarkable manner, the views of the eminent naturalists to whom I have referred.

Note.—In the following tables the general ground colour of the dorsal surface of the full-grown caterpillar is indicated in the respective columns by an asterisk. Special markings and their colours are described in the column headed "Remarks." Larvæ merely pubescent are not considered hairy.

TABLE OF CATERPILLARS OF BRITISH BUTTERFLIES.†

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Maniola Epiphron</i> (= <i>Cassiope</i>) ...	...	*	...	...	...	...	...	*	Pale green, striped with darker green. Spiracular line white. Lateral lines
" <i>Medea</i> (= <i>Blandina</i>) ...	...	...	...	...	*	...	...	*	Medio-dorsal line blackish. Lateral lines paler.
<i>Melanargia Galathea</i> ...	...	*	...	...	*	...	...	*	Colour variable, greenish or brown. Medio-dorsal line dark, bordered by pale area, intersected by a reddish sinuous line. Lateral area pale ferruginous. Spiracular line whitish.
<i>Satyrus Aegeria</i> ...	...	*	...	...	*	...	...	*	Colour variable, dull green or brown: Medio-dorsal line dark. Marginal lines whitish.
" <i>Megara</i> ...	...	*	...	...	...	...	...	*	Medio-dorsal line darker. Lateral stripes paler.
<i>Epinephele Jurina</i> (= <i>Jantira</i>) ...	...	*	...	...	...	...	...	*	Medio-dorsal line darker. Lateral lines whitish.
" <i>Tithonus</i> ...	...	*	...	...	*	...	...	*	Colour variable, greenish or brown. Medio-dorsal line darker. Lateral stripes whitish.
<i>Hipparchia Hyperanthus</i> ...	...	...	...	...	*	...	...	*	Medio-dorsal line darker. Lateral lines paler.
" <i>Semele</i>...	...	...	...	...	Drab	...	...	*	Medio-dorsal and other lines darker. Medio-dorsal and other lines darker, bordered with whitish.
<i>Ctenonympha Pamphilus</i>...	...	*	...	...	...	...	...	*	Medio-dorsal line dark, bordered with yellow. Lateral lines yellow.
" <i>Typhon</i> (= <i>Davus</i>)	...	*	...	...	...	...	...	*	Two yellow dorsal lines. Spines rust-coloured.
<i>Argynnis Papilio</i> ...	Spiny	...	...	*	...	...	...	*	Body marbled with black. Dorsal line black, bordered with yellow. Row of red blotches along side. Spines black.
" <i>Aglais</i> ...	Spiny	...	...	...	*	...	...	*	Medio-dorsal line white, passing through a row of black markings. Spines whitish.
" <i>Adippe</i> ...	Spiny	...	...	...	*	...	...	*	Spines and medio-dorsal line white. (?)
" <i>Niope</i> ...	Spiny	...	...	...	*	...	...	*	Medio-dorsal and lateral lines whitish.
" <i>Lathonia</i> ...	Spiny	...	...	...	*	...	...	*

† The order and nomenclature followed is that of Kirby's "Synonymic Catalogue of Diurnal Lepidoptera." The descriptions of larvæ are mostly from Newman's "British Butterflies."

TABLE OF CATERPILLARS OF BRITISH BUTTERFLIES—continued.

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Argynnis Euphrosyne</i> ...	...	...	...	*	...	...	...	*	Lateral stripes pale. Body sprinkled with white dots. Dorsal spines yellow at base, black at tip.
" <i>Selene</i> ...	Spiny	...	...	...	*	...	...	...	Spines pale at base, black at tip.
<i>Melitæa Aurinia</i> (= <i>Artemis</i>) ...	Spiny	...	...	...	...	...	...	...	Medio-dorsal and lateral lines, composed of white dots.
" <i>Cinxia</i> ...	Spiny	...	...	*	...	...	...	...	Belts of white dots between segments.
" <i>Athalia</i> ...	Spiny	...	...	Grey	...	...	...	*	Body dotted with white.
<i>Vanessa Calbum</i> ...	Spiny	...	...	...	...	...	...	...	Body with brown markings. Medio-dorsal line white.
" <i>Antiope</i> ...	Spiny	...	...	*	...	...	...	...	Row of dorsal blotches dull red.
" <i>Io</i> ...	Spiny	...	...	*	...	...	...	...	Body dotted with white.
" <i>Urtice</i> ...	Spiny	...	...	*	...	...	...	*	Body dotted with yellow. Lateral lines yellowish.
" <i>Polychloros</i> ...	Spiny	...	...	...	Tawny	...	...	*	Medio-dorsal line black. Body covered with pale warts.
<i>Pyrameis Alalanta</i> ...	Spiny	...	...	Grey-green or black	...	...	...	*	Colour variable. Lateral stripes white or yellow. Colour of spines variable.
" <i>Cardui</i> ...	Spiny	...	...	*	...	...	...	*	Medio-dorsal line occasionally black, bordered by rows of whitish dots.
<i>Limenitis Sybilla</i> ...	Spiny	*	...	...	...	...	...	*	Dark green, with yellow warts. Lateral lines white.
<i>Apatura Iris</i> ...	...	*	...	...	...	...	...	*	Head with two greenish horns. Sides of body with oblique yellow stripes. Lateral lines yellow.
<i>Nemeobius Luchina</i> ...	*	...	...	...	Brownish-grey	...	...	*	Medio-dorsal and lateral lines smoky olive. Body with yellow dots and orange hairy warts.
<i>Lycæna Hippothoë</i>...	...	*	...	...	...	...	...	...	Colour obviously protective.
" <i>Phicæa</i> ...	...	*	...	...	...	...	...	*	Body dotted with white warts. Medio-dorsal and lateral lines pink when present.
<i>Cupido Badieus</i> ...	...	*	...	...	*	...	...	*	Colour variable, olive or bright green or reddish-brown. Medio-dorsal line dark.
" <i>Argus</i> (= <i>Egon</i>) ...	...	*	...	...	...	...	...	*	Lateral lines white. Oblique stripes along sides of body.
									Medio-dorsal line brown, edged with white. Lateral lines whitish. Sides of body with paler oblique stripes.

TABLE OF CATERPILLARS OF BRITISH BUTTERFLIES—continued.

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
Cupido Alexis (= <i>Agestis</i>)	...	*	*	Medio-dorsal line brownish-purple. Sides of body with oblique faint lines. A double row of bristly warts.
" Icarus (= <i>Alexis</i>)	...	*	*	Medio-dorsal line darker. Lateral stripes whitish. Faint oblique lines on sides. Body covered with minute black warts, each emitting a hair.
" Thetis (= <i>Adonis</i>)	...	*	*	Dorsal series of fulvous spots. Lateral lines yellow.
" Corydon	...	*	**	Body sprinkled over with black dots, each emitting a short bristle. Six longitudinal series of yellow spots. Dorsal series on warts.
" Argolus	...	*	*	Dorsal line green.
" Alsus	...	*	*	Medio-dorsal line orange-red. Sides of body with oblique yellowish lines. Pale side stripes.
" Semilargus (= <i>Aetis</i>)	**	Larva unknown. (?)
" Arion	...	*	Dirty pink	...	*	Medio-dorsal line rust-coloured.
Thecla Pruni	...	*	*	Dorsal and lateral lines yellow.
" W-album	...	*	*	Dorsal furrow brown, edged with yellow. Sides of body with pale oblique stripes, covered with delicate hairs.
" Rubl...	...	*	*	Medio-dorsal, lateral and oblique side lines yellowish.
Zephyrus Quercus	*	*	Body covered with fine scattered hairs.
" Betulae	...	*	*	Longitudinal and oblique lines whitish.
Leucophasia Sinapis	...	*	*	Body slightly hairy.
Pieris Daphidice	Bluish-grey	*	Medio-dorsal line dark green, edged with yellowish-green. Spiracular line yellow. Body partially dotted with black. Longitudinal lines yellow. Body with scattered black warts, each emitting a slender hair.

TABLE OF CATERPILLARS OF BRITISH BUTTERFLIES—continued.

Name of Species.	Halcy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Pieris Napl</i>	*	Body covered with black warts, each emitting a slender hair
" <i>Rape</i>	*	*	Longitudinal lines and series of spots yellow. Body with black and white warts, each emitting a very minute hair.
" <i>Brassicæ</i>	Bluish-gray	*	Body covered with black warts, each emitting a slender hair. Medio-dorsal and lateral lines yellow.
" <i>Cratægi</i>	*	*	Two dorsal rust-coloured stripes composed of dots. Hairs of head black and white, of dorsal warts rust-coloured.
<i>Gonepteryx Rhamni</i>	*	*	Body covered with extremely minute black warts, each of which emits a short white bristle. Pale slender lateral wavy lines.
<i>Collas Croceus</i> (= <i>Edusa</i>)	*	*	Body covered with minute black warts, surrounded by a whitish ring, each wart emitting a short hair. Pale lateral stripes.
" <i>Hyale</i>	*	*	Body sprinkled with black dots. Spiracular line white interrupted with yellow.
<i>Euchloë Cardamines</i>	*	*	Body covered with minute black warts, each emitting a short bristle. Lateral stripe white.
<i>Papilio Machaon</i>	*	Scent-emitting tentacles protrusible from transverse dorsal slit of 2nd segment.
<i>Pamphila Comma</i>	*	Black rings between segments, alternated with transverse black bars, interrupted by bright orange spots. Linear white spot on each side of 10th and 11th segments very near ventral surface.

TABLE OF CATERPILLARS OF BRITISH BUTTERFLIES—continued.

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Pamphila Sylvanus</i>	*	*	Dark dorsal line dotted with black. White transverse spots beneath on 10th and 11th segments.
<i>Thymelicus Thaumias</i> (= <i>Linea</i>)	*	*	Body with six slender white stripes. Night feeder. Dorsal line dark, edged with yellowish and enclosing a paler line. Double yellow line along side.
<i>Hesperia Malva</i>	*	*	*	Two white spots as in <i>P. Sytaura</i> . Colour variable, brown or green. Dorsal line darker. Lateral line triple. Central portion dark, lateral portions white.
<i>Heteropterus Palemon</i>	*	*	Two yellow stripes down the back.
<i>Nisoniades Tages</i> (= <i>Paniscus</i>)	...	*	*	Two yellow lines along the sides, each surmounted by black spots.

TABLE OF CATERPILLARS OF BRITISH MOTHS.†

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Smerinthus ocellatus</i>	*	*	Body dotted with white. Oblique white lateral stripes. Horn blue.
" <i>Populi</i>	*	*	Body dotted with yellow. Oblique yellow lateral lines. Horn yellowish above, reddish beneath.

† The order and nomenclature followed is that of Newman's "British Moths," from which work the descriptions are also mostly taken.

TABLE OF CATERPILLARS OF BRITISH MOTHS—*continued*.

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Smerluthus Tillæ</i>	*	*	Body dotted with yellow. Oblique yellow lateral lines sometimes margined with red. Horn blue above, yellow beneath; behind it a violet plate edged with yellow.
<i>Acherontia Atropos</i>	*	*	..	*	*	Body towards head and lower part of sides green. Oblique lateral lines violet. A brown variety known.
<i>Sphinx Convallulæ</i>	*	*	*	Oblique lateral stripes black, bordered with white. Horn yellowish. A brown variety known.
" <i>Ligustri</i>	*	*	Oblique lateral stripes white, bordered above with lilac. Horn black, under side of lower half yellow.
" <i>Phaetri</i>	*	*	Dorsal stripe red-brown. Lateral lines yellow. Horn black. Resembles food plant.
<i>Deilephila Euphorbiæ</i>	*	..	*	..	*	Body with whitish dots and red spots. Dorsal line and head red. Horn red, tipped with black.
" <i>Galli</i>	*	..	*	*	*	Colour variable, bluish-green, brown or black. Dorsal line yellowish, a row of yellow spots on each side. Horn red.
" <i>livornica</i>	Yellowish-grey	..	*	..	..	*	Broad dorsal line and under side black. Body with crescent-shaped black markings on each side, and double row of orange spots. Horn red, with black tip.
<i>Charocampa Celerio</i>	*	*	Colour variable, green or purplish-brown. Two black spots, dotted with yellow, and encircled by a yellow ring on 5th and 6th segments. Horn brown.
" <i>Porcellus</i>	*	*	Colour variable, brown or green. Body mottled with dark brown, dark green or black. Ocellated bluish spot on 5th and 6th segments.

TABLE OF CATERPILLARS OF BRITISH MOTHS—continued.

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Charocampa Elpenor</i> ...	...	*	...	...	*	...	...	...	Colour variable, brown or green. Large ocellated spots on 5th and 6th segments. Horn black, with white tip.
" <i>Nerli...</i> ...	...	*	...	...	*	Orange	...	*	Colour variable, brown, green or orange. Body dotted with white. Blue spot on 3rd segment. Lateral band whitish. Horn orange-yellow.
<i>Macroglossa stellatarum</i> ...	...	*	...	...	*	...	...	*	Colour variable, green or plukish-brown. Lateral lines whitish. Horn dull blue, tip yellowish.
" <i>fuclformis</i> ...	...	*	...	...	*	...	...	*	Colour variable, bluish-green or brown. Body covered with minute whitish warts. Dorsal line yellowish. Lateral lines white and pink. Horn brown-red or orange.
" <i>bombylifformis</i>†	...	*	...	...	?	...	...	...	Body dotted with yellowish-white. On each side of 5th to 12th segments two rows of reddish spots. Horn reddish.
<i>Limacodes Alsellus</i> ...	...	Yellow-green	...	...	...	...	...	*	Yellow dorsal line. Body with shining pinkish dots.
<i>Testudo</i> ...	...	*	...	...	...	...	...	*	Two whitish lines down back. Lateral line yellow. Body with shining pinkish pimples.
<i>Procris Staticea</i> ...	Downy	...	Yellowish	*	...	...	...	*	Body covered with warts and black papillae. Medio-dorsal line whitish, bordered with reddish-purple. Lateral line yellowish above, reddish-purple beneath.
" <i>Geryon</i> ...	Downy	...	Yellowish	*	...	...	...	...	Body covered with minute black dots. Medio-dorsal line whitish, bordered with purple. Broad dingy yellow stripe on each side.

† The *Sesilia*, *Zenzeridae*, and *Hepialidae*, which should here be inserted, according to the arrangement followed by Newman, have been omitted because the larvae are all internal or subterranean feeders. The *Sesilia* (*Agrotidae*) have been recently shown by Mr. A. G. Butler (Trans. Ent. Soc. 1878, p. 121) to be closely allied, on the one hand, to the *Pyrales*, and on the other to the *Gelechiidae*.

TABLE OF CATERPILLARS OF BRITISH MOTHS—*continued*.

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped	Remarks.
<i>Proctis Globularia</i> ...	Downy	...	...	Blackish	...	...	...	*	Row of triangular green spots on back. Lateral line blue, with included row of yellow dots.
<i>Zygena Minos</i> ...	...	*	*	...	...	...	...	...	Colour variable, green or yellow. Two rows of black spots on each side.
" <i>exulans</i> ...	*	...	...	...	Dingy-ochraceous	...	...	...	Hairs black. Lateral row of pale spots.
" <i>Trifolii</i> ...	...	*	...	...	...	...	...	...	Two dorsal rows of black spots, and a row of black spots on each side.
" <i>Mellori</i> ...	...	*	...	...	...	...	...	*	Differs but little from preceding species (Briggs).
" <i>Lonicera</i> ...	*	...	Yellowish-green	...	...	...	...	*	Speckled with black. Two black stripes on each side. Lateral row of yellow spots between black lines.
" <i>Filipendula</i> ...	Slightly	...	*	...	...	...	...	...	Two rows of black spots on each segment.
<i>Nacina Anella</i> ...	*	...	...	...	...	...	...	*	Body with hairy warts; hairs black.
<i>Nola cucullatella</i> ...	*	...	...	...	*	...	...	...	Medio-dorsal and other stripes yellow.
" <i>confusalis</i> (= <i>crisulalis</i>) ...	*	...	Dull yellow	...	...	...	...	*	Row of paler spots down back.
" <i>Strigula</i> ...	*	...	Dull yellow	...	...	...	...	*	Fine blackish lines along body.
" <i>Centonalis</i> ...	...	...	...	...	...	...	...	...	Dorsal stripe broad, yellowish or whitish
" <i>albinalis</i> ...	*	...	Yellowish green	...	...	Orange	...	...	flesh-coloured. Subdorsal stripe brownish-grey. Hairs brown and yellowish. Black spot on 7th segment.
<i>Nulcaria Senex</i> ...	*	...	...	Smoky	...	...	...	...	Caterpillar unknown. (?)
" <i>mundana</i> ...	*	...	*	...	Greyish-brown	...	...	*	Colour variable. Two rows of black marks on dorsal surface. Hairs whitish, springing from six tubercles on each segment (Barrett).
									Six tubercles on each segment emitting tufts of hairs so dense as to conceal skin.
									Hairs smoky and brown (Buckler and Hellins).
									Dorsal line greyish-brown, subdorsal yellow. Sides and hairs greyish-brown (Buckler and Hellins).

TABLE OF CATERPILLARS OF BRITISH MOTHS—continued.

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Setina irrorella</i> ...	*	*	*	Dorsal line yellow.
<i>Calligenia miniata</i> ...	*	*	*	Hairs blackish.
<i>Lithosia mesomella</i> ...	*	Greyish	...	...	...	*	Blackish stripe on each side of back.
" <i>muscerda</i> ...	*	*	*	Hairs very dense and blackish.
" <i>nitta</i> (= <i>aureola</i>) ...	*	Grey	...	...	...	*	Dorsal and subdorsal lines black. Red spots on 2nd and 13th segments. Hairs brown (Buckler and Hellins).
" <i>pygmaeola</i> ...	*	*	*	*	Medio-dorsal line double, composed of orange spots.
" <i>deplana</i> (= <i>helvola</i>) ...	*	Grey	...	...	...	*	Thick black dorsal line. Spiracular line whitish hairs brown (Buckler).
" <i>caniola</i> ...	*	*	*	Colour variable, grey or white. Sides grey, brownish-grey or greenish-grey.
" <i>lurideola</i> (= <i>complanata</i>) ...	*	Blackish	...	...	...	*	Subdorsal stripe black. Hairs grey (Hellins).
" <i>molybdeola</i> ...	*	Grey	...	...	...	*	Medio-dorsal line black, bordered with grey.
" <i>complanata</i> ...	*	*	*	Lateral lines orange.
" <i>griseola</i> ...	*	Blackish	*	...	...	*	Lateral line reddish.
" <i>stramhalola</i> ...	*	Orange	...	...	Dorsal stripe black. Subdorsal row of part-coloured spots, then a black stripe. Greyish ochreous line above legs (Hellins).
" <i>quadra</i> ...	*	Grey	...	...	...	*	Yellow, red and white spotted stripe on each side of back; orange line above the feet.
" <i>rubricollis</i> ...	*	Grey	...	...	...	*	Subdorsal orange ochreous stripe. Orange patch on 3rd segment. Hairs dark brown (Hellins).
								...	Back of 2nd, 3rd and anal segments orange. Subdorsal series of red markings. Dorsal line and hairs brown (Guénée and Buckler).
								*	Yellow and black stripes, bordered with red warts.
								*	Black stripes, in which are red and white spots.

TABLE OF CATERPILLARS OF BRITISH MOTHS—continued.

Name of Species.	Ilary.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Eulepia grammica</i>	*	*	Dorsal line yellow; lateral lines white. Reddish hairy warts.
" <i>Cilicrura</i>	*	*	Dorsal and lateral lines white.
<i>Delopeia putchella</i>	Bluish-grey	*	Dorsal stripe white; hairs black; row of double scarlet spots down side
<i>Euchelia Jacohera</i>	*	...	Orange	...	...	Slightly hairy; orange annulated with black.
<i>Callimorpha Dominula</i>	*	*	Hairs black, springing from bluish warts.
<i>Parhemonia russula</i>	*	*	Dorsal and lateral lines yellow.
<i>Chelonia Plantaginis</i>	Dark grey	...	...	...	...	Yellow dorsal line. Hairs reddish-brown.
" <i>Caja</i>	*	Hairs at both ends black; red-brown on middle segments.
" <i>villica</i>	Hairs on back grey; on side and about head reddish-brown.
<i>Aretia fuliginosa</i>	Hairs brown.
" <i>menica</i>	Grey	*	...	...	*	Colour variable, grey or smoky-brown.
" <i>lubripeda</i>	Greish	...	...	...	*	Dorsal line pale. Hairs rust-coloured.
" <i>Mentastri</i>	*	*	Dorsal line pale; lateral stripes broad and grey. Pale grey oblique stripes along sides.
" <i>Urtice</i>	Blackish	...	...	...	*	Dorsal line orange. Hairs brown.
<i>Liparis chrysorrhæa</i>	*	...	*	...	*	Indistinct dorsal line.
" <i>auriflua</i>	*	...	*	...	*	Tubercles and humps. Hairs white and reddish. White stripe on each side of back. Scarlet markings.
" <i>Salidis</i>	Greish	...	...	...	*	Tubercles and humps. Red projection behind head, and two red lines along back.
" <i>dispar</i>	*	*	Row of white hairy tubercles along side. Row of conspicuous white spots down back, with black stripe containing red warts on each side.
								*	Netted with grey. Dorsal line grey. Red and grey tubercles on body. Hairs on back black, on sides brown.

TABLE OF CATERPILLARS OF BRITISH MOTHS—continued.

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Liparis monacha</i>	*	Grey	...	...	...	*	Dorsal line darker. Two bluish tubercles on back of 2nd segment. Reddish tubercle on back of 9th, 10th and 11th segments.
<i>Orgyia pudibunda</i>	*	...	Yellowish-green	...	...	Reddish-yellow	...	...	Colour variable. Incisions between 5th to 8th segments deep black. 5th to 8th segments with a yellow tuft of hair; 12th with a red tuft.
" <i>fascelina</i>	*	*	Hairs yellow. Black tufts on 5th to 8th segments, with white hairs on each side; long black tuft on 12th segment.
" <i>canosa</i>	*	*	Hairs yellow. Two black tufts of hair from 2nd segment, and one tuft from last segment.
" <i>gonostigma</i>	*	Orange	...	*	Four rows of black spots forming stripes. 5th to 8th segments with tufts of brown hairs; 2nd segment with two tufts of black hairs; 12th segment with one, and 13th with three black tufts.
" <i>antiqua</i>	*	*	*	Pink	...	...	Parti-coloured, spotted with pink. 5th to 8th segments with tufts of yellow hairs; two tufts of black hairs on 2nd segment, and one on 12th.
<i>Demas Coryli</i>	*	Greyish	...	...	...	*	Broad black dorsal line. Tuft of brown hairs on 5th, 6th and 12th segments.
<i>Trichiura Cratagi</i>	*	Dark grey	...	...	...	...	Two red hairy tubercles on each segment. Row of pale spots along each side. A variety, annulated something like the larva of <i>Bombix Rubi</i> , is known.
<i>Pecilocampa Populi</i>	*	Grey	...	...	...	*	Marbled with black and ochreous. Whitish spots in a grey band on each segment. Orange subdorsal line. Long hairs on sides above legs. Probably protected by resemblance to lichen.

TABLE OF CATERPILLARS OF BRITISH MOTHS—continued.

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Ertogaster lanestris</i> ...	•	•	•	Slightly hairy. Three white spots and two red warts on each segment. Pale grey stripe along each side.
<i>Bombyx neustria</i> ..	•	•	...	Orange	•	•	Many coloured stripes, white, black, blue and orange. Dorsal line white. Slightly hairy, hairs dark brown above, golden brown towards legs. Head and 2nd segment blue.
" <i>castrensis</i> ...	•	•	...	Orange	...	•	Many coloured stripes, grey, orange-brown and black. Dorsal line whitish. Hairs golden brown.
" <i>Rubi</i> ...	•	•	Orange-brown	...	...	...	Sides and spaces between segments black.
" <i>Quercus</i> ...	•	•	•	Hairs amber coloured, short and dense. Interrupted white lateral line. Red centred white spot on 3rd and 4th segments above lateral line.
" <i>Trifolii</i> ..	•	•	•	Hairs bright orange on back, grey on sides. Grey stripe on each side.
<i>Odonestis potatoria</i> ...	•	Blue-grey	...	Body dotted with black. Orange spots and oblique streaks on each side, alternated with tufts of white hair.
<i>Laslocampa quercifolia</i> ...	•	Grey	•	...	...	•	Colour variable. Incisions between 2nd and 4th segments purple. Lateral stripe whitish. Hump on 12th segment.
" <i>ilicifolia</i> ..	•	Grey	...	...	...	•	Slightly hairy. Row of fleshy protuberances along each side above legs.
<i>Endromis versicolor</i>	•	•	Hairs reddish. Dorsal line black. Reddish spot on each segment. Lateral stripe bluish below, white above.
	...	•	•	Sides dotted with black. Back paler than sides. Medio-dorsal line darker. An oblique white line on each side of each segment. Hump on 12th segment, ending in a short white horn.

TABLE OF CATERPILLARS OF BRITISH MOTHS—continued.

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Saturnia carpini</i> †	...	*	Black-ringed pink tubercles on each segment. Tuft of short black bristles emitted by each tubercle. Probably protected by resemblance to food-plant, heath.
<i>Platypteryx lacertula</i>	Yellowish-brown	*	*	...	...	*	Tubercles on 3rd to 6th segments. Medio-dorsal series of black streaks and two oblique black streaks on each side of each segment. Lateral line white, intersected with pink.
" <i>sicula</i>	*	...	*	*	Two tubercles on 4th segment, brown with yellow tips. Dorsal region brownish-ochreous, blotched with dark crimson-brown on thoracic segments, yellow on the remainder. Lateral region pink, freckled with dark crimson-brown (Buckler).
" <i>falcula</i>	...	*	*	*	Tubercles on 3rd to 6th segments, each emitting short bristles. Minute warts on 7th to 11th segments. Broad red-brown stripe down middle of back.
" <i>hamula</i>	Greyish-brown	...	...	*	Broad dorsal stripe, partly greenish-brown and partly yellowish-brown; edged with yellow. Tubercles on 4th segment.
" <i>unguicula</i>	*	*	Two tubercles on 4th segment; body covered with warts, each emitting a minute hair. Narrow white line on each side; white V-shaped mark on back of 6th segment. Pale spot on each side of 11th segment.
<i>Cilix spinula</i>	*	*	Medio-dorsal line darker. Pale lateral line on each side of 12th segment. Tubercles on 3rd and 4th segments.

† The *Geometrae* and *Noctuae* are omitted from here.

TABLE OF CATERPILLARS OF BRITISH MOTHS—continued.

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Dieranura bicuspis</i>	Yellowish-green	...	...	...	...	...	*	Distinct stripe on each side, lower part white, upper part pink. Oblique white streaks on each segment. Caudal horns black, tipped with red.
" <i>fulvula</i>	Green and white	...	...	...	...	...	*	Lateral stripe white, margined with purple. Dorsal area white, with median green line. Oblique green stripes on 7th to 11th segments. Lateral surface green, blotched with purple and orange. Caudal horns white.
" <i>brida</i>	*	*	*	Dorsal area brownish, with darker and lighter marblings, and bordered with yellow. Lateral area green, dotted with brown. Anal tubes green, containing protrusible filaments.
" <i>vinula</i>	*	*	*	Dorsal area whitish, striated with purplish-brown. Lateral stripe white. Lateral area green. Caudal tubes whitish, with pink protrusible filaments.
<i>Stauropus Fagi</i>	*	*	Medio-dorsal line paler, margined with black. Slender black markings on sides. Body covered with pale points. Two humps on each segment from 5th to 10th. Caudal appendages.
<i>Petasia cassinea</i>	*	*	Colour variable. Longitudinal whitish lines.
" <i>nubeuulosa</i>	*	*	Oblique yellow stripe on each side of 4th segment. Whitish clouds on back and sides. Yellow line on elevation on 12th segment. Yellow and white dots on sides.
<i>Pygma bucephala</i>	*	*	*	Broad dorsal and three lateral lines black. Hairs long and soft.

TABLE OF CATERPILLARS OF BRITISH MOTHS—continued.

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Clostera curtula</i> ...	*	**	Reddish-grey	...	...	Black dorsal humps on 5th and 12th segments. Orange warts on sides. Hairs white. Body dotted with black.
" <i>anachoreta</i> ...	*	**	...	*	*	Brown humps on 5th and 12th segments. Body mottled with grey. Medio-dorsal line whitish. White spots surrounded by black on 5th segment. Black markings on each side of dorsal line. Hairs brown.
" <i>reclusa</i> ...	*	Grey	...	...	...	*	Black humps on 5th and 12th segments. Broad grey dorsal line, containing yellow markings. Slightly hairy. Lateral rows of black and yellow spots.
<i>Gluphisia crenata</i> ...	**	*	*	Dorsal line spotted with red-brown, and bordered with yellow.
<i>Ptilophora plumigera</i>	*	*	*	Broad dorsal line bluish, with white line on each side. Two wavy lateral yellow lines.
<i>Ptilodontis palpina</i>	*	*	Double row of minute white warts down back. White lateral stripe, with a yellow-black margined line below.
<i>Notodonta camelina</i>	*	*	Two pink-tipped tubercles on 12th segment, with short black bristles. Slender bluish dorsal stripe. Spiracular stripe composed of dots, pink and white, and white lines. Scattered black bristles on body.
" <i>cucullina</i>	**	...	Greyish	...	...	...	*	Dorsal line brown. Hump on 12th segment. Row of spiracular black dots.
" <i>carmelita</i>	*	*	Raised yellow markings on back. Particoloured lateral stripe white, yellow and pink.
" <i>bicolor</i>	*	*	Four slightly darker stripes on dorsal surface. Lateral lines bright yellow.

TABLE OF CATERPILLARS OF BRITISH MOTHS—*continued*.

Name of Species.	Hairy.	Green.	Yellow.	Black.	Brown.	Red.	Blue.	Striped.	Remarks.
<i>Notodonta dictæa</i>	•	•	•	Colour variable, green or brown. Paler green stripe on each side. Yellow-green stripe below spiracles. Hump on 12th segment.
" <i>dictæoides</i>	•	•	Lateral yellow stripe. Hump on 12th segment.
" <i>dromedarius</i>	•	•	Green, with purplish-brown markings, forming a stripe down back. Humps on 5th to 9th segments.
" <i>trilophus</i>	•	5th, 6th, 7th and 12th segments with humps.
" <i>ziczac</i>	•	•	Humped on 6th, 7th and 12th segments. Darker and paler marblings on back and sides. Paler oblique lines on sides.
" <i>trepida</i>	•	•	Two yellowish-white dorsal lines. Lateral brown blotches on 2nd and 3rd segments. Seven oblique stripes along sides, pink in upper and whitish in lower portion.
" <i>chaonia</i>	•	•	Lateral and dorsal lines yellow.
" <i>dodonea</i>	•	•	Double yellow dorsal line. Lateral stripe alternately pink and pale yellow.
<i>Diloba caruleocephala</i>	•	•	•	Broad yellow dorsal stripe. Sides bluish-green. Yellow stripes below spiracles. Numerous black warts all over the body.